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of effort and of funds. The program of the conference is in the hands of the Committee on Pacific Exploration of the National Research Council.

THE U. S. Bureau of Chemistry at Washington announces that the work on photosensitizing dyes begun during the war for the Bureau of Aircraft Production has met with such success as to make possible the preparation in the United States of dyes of all the recognized types: pinaverdol (including Orthochrome T), cyanine, pinacyanol and dicyanine; and of a new type useful for astrophotographic work. The Color Laboratory of the bureau will place its experience at the disposal of any manufacturer who wishes to prepare these important photographic aids for the American market; and pending their commercial availability is prepared to supply them to users at a price fixed by the secretary of agriculture.

#### UNIVERSITY AND EDUCATIONAL NEWS

DR. EDGAR F. SMITH, provost of the University of Pennsylvania since 1911, tendered his resignation to the board of trustees on February 9. Dr. Smith became professor of chemistry in the University of Pennsylvania in 1888.

DR. JACOB GOULD SCHURMAN has resigned the presidency of Cornell University. Dr. Schurman, previously professor of philosophy, became president of Cornell University in 1892.

DR. CHARLES W. DABNEY has resigned the presidency of the University of Cincinnati, which he has held since 1904.

DR. JOHN M. T. FINNEY, Baltimore, has declined the offer made him by Harvard University and will continue his connection with the Johns Hopkins Hospital and Medical School.

DR. H. H. LANE, who has since 1905 been head of the department of zoology of the University of Oklahoma, has accepted a position for next year as head of department of zoology, of Phillips University, Enid, Oklahoma.

#### DISCUSSION AND CORRESPONDENCE BLOOD-INHABITING PROTOZOA FOR CLASS USE

AT the present time there are several large and important groups of Protozoa that remain unknown to students of biology chiefly because they are not easy to obtain when they are needed. One of these groups that is of added interest because of the economic importance of some of its members contains the hemoflagellates, including the trypanosomes. Trypanosomes are responsible for the human disease known as sleeping sickness, that is prevalent in certain parts of Africa, and for Chagas' disease in South America. They also cause diseases in domestic animals such as surra, nagana, murrina, mal de caderas and dourine which result in great losses every year.

The first trypanosome described was found in the frog in 1843 and was given the name *Trypanosoma rotatorium*. Specimens belonging to this species occur in the frogs of this country, particularly in the "water" frogs such as the green frog, *Rana clamitans*, and the bullfrog, *Rana catesbiana*, but they are present usually in small numbers and not all frogs are infected. If it is desired to obtain for study this type species the centrifuge may be used to concentrate the specimens. Blood may be obtained from an etherized frog and mixed to prevent clotting with a solution of sodium citrate made up as follows: sodium citrate, 1½ grams; sodium chloride 1½ grams; water 250 c.c. After centrifuging for about ten minutes the trypanosomes, if present, will be found in a layer at the top of the mass of red blood cells.

A much more simple method of furnishing trypanosomes to a large class of students is to collect a few newts, *Diemyctylus viridescens*, from the water. Tobey in 1906 first described the species in these newts naming it *Trypanosoma diemyctyli*. He found them present in every specimen that he had purchased in an animal store in Boston. The writer has had a similar experience with newts collected for him in Pennsylvania. Seventy-

eight of the olive-green water form and seven of the vermillion land form were examined. Every one of the former was abundantly supplied with the parasites, but only two of the land forms were infected.

All that is necessary to obtain living specimens of the trypanosomes for study is to snip off a little piece from the end of the tail, and then squeeze out several drops of blood on each slide. A cover glass can be added directly or a ring of vaseline may first be spread around the blood so that the preparation will be sealed when the cover glass is put in place. In such a preparation the spiral movement of the organism is evident, and the flagellum and undulating membrane are easily observed in action. The nucleus and other structures are clearly revealed in dried films stained with Wright's or Leishman's stains. Obtain a drop of blood near one end of a clean slide. Place the end of another slide near the drop of blood at an angle of about 30 degrees with the shorter end of the slide. Draw this slide along until it touches the drop. When the blood has spread along the edge, push the slide fairly rapidly toward the other end. A thin even film will result covering about one half of the slide. Allow this to dry. Then place a few drops of the stain on the film and allow to remain one minute. Add double the volume of distilled water and after five minutes wash the film with distilled water, and dry in the air. Balsam and a cover glass may then be added but the stain will fade. If oil immersion objectives are available no cover glass should be used but the oil placed directly on the film, and after the examination is completed this oil may be wiped off with lens paper or washed off with xylol. The stain may be obtained in small 0.1 gram tubes. This amount is dissolved in 10 c.c. of pure methyl alcohol and is then ready for use. R. W. HEGNER

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#### HORIZONTAL RAINBOWS

TO THE EDITOR OF SCIENCE: With respect to Reese's account of an "unusual form of rain-

bow" in SCIENCE for December 12, 1919 (Vol. L., p. 542), it may be said that, in Europe, rainbows on the surfaces of ponds and lakes have been reported from time to time during the past fifty years. They have been observed, also, on several bodies of water in Japan during the past few years and the investigators of that country have given some attention to the mathematical explanation of these phenomena.

In the United States these spectral displays have been seen frequently on the surface of Lake Mendota at Madison, Wisconsin, during the past ten or twelve years. Some of these displays have been unusually brilliant and varied; double and triple primary bows together with a secondary bow have been noted at times. These phenomena have been described in the *Monthly Weather Review* for February, 1916 (Vol. 44, p. 65).

The complete bows that have appeared on the surface of Lake Mendota possessed a very different outline from the diagram shown by Reese. They were parabolic in shape instead of circular; neither did they possess an inverted segment connecting the outer extremities as in his figure.

As far as the present writer is aware, these horizontal rainbows have been reported for only two lakes in this country, namely, Lake Mendota and the lake referred to by Reese. This seems to indicate that it is not a widespread phenomenon, or else other observers have not taken the trouble to publish accounts of their observations. It would be interesting to know whether these spectral colors have been seen on any other bodies of water in this country.

CHANCEY JUDAY

MADISON, WISCONSIN

#### CHEMISTRY APPLIED TO COMMERCE

THE divorce of science and industry, which has long been a noisesome skeleton in our economic household, is fast being annulled. "During the war, American industry acquired—or had thrust upon it—a wholesome respect for American science," *Drug and Chemical*